

REMARKS

Reconsideration of this application, as amended, is respectfully requested.

Claims 1-12 and 24-26 are pending. Claims 1-12 and 24-26 stand rejected.

Claims 1, 6 - 8, and 12 have been amended. Claims 24 - 26 have been canceled. Claims 27 and 28 have been added. Support for the amendments is found in the specification, the drawings, and in the claims as originally filed. Applicants submit that the amendments do not add new matter.

Material Incorporated by Reference

The incorporation of essential material in the specification by reference to a foreign application or patent, or to publication is improper. Applicant is required to amend the disclosure to include the material incorporated by reference.

Applicant has established that the material incorporated by reference is not essential, therefore no changes have been made to the specification.

Rejections Under 35 U.S.C. § 112

The Examiner has rejected claim 8 under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicants regard as the invention. The Examiner has stated that

There is no antecedent basis in claim 7 for a “filter”.

(p. 3, Office Action 4/13/04)

Applicants have amended claim 8 to overcome this rejection.

Rejections Under 35 U.S.C. § 103(a)

Claims 1, 2, 6-8, 12, and 24-26 stand rejected under 35 U.S.C. §103 as being unpatentable over European Patent No. 0 766 050 (“EP ‘050”) in view of Japanese Patent No. 59-84617 (“JP ‘617”).

The Examiner has stated that

EP ‘050 discloses a contactor 10 having spray nozzles 64 for fluid, inlet 53 and outlet 50 for air, packing 65, a heater 68 and an outlet for liquid attached to pump 18. Water in the tower 10 is treated by a chiller as disclosed in col. 9, lines 1-7 and claim 13, penultimate paragraph. Temperature sensors 27 and 29 perform the same functions as the temperature sensors claimed, by applicant, before and after the heater. Filters are shown at 40.

(p. 4, Office Action 4/13/04)

EP ‘050 states

As shown in line 2 of FIGURE 4, a constant flow of air is brought into tower 10 at a temperature of 90°F and 85% relative humidity (shown as point E), and the water in tower 10 is treated with a chiller (not shown) so that the exit air stream is brought down to a temperature of 60°F and a relative humidity of 100% (shown as point C).

(Col. 9, lines 1-9)

An apparatus for conditioning an air stream to be used in a paint spray booth, the air stream being conditioned to desired, predetermined temperature and relative humidity levels, comprising

an adiabatic saturator, wherein the adiabatic saturator includes a spray tower containing packing elements through which an air stream and a water stream flows, the water stream entering the saturator being maintained at a constant, predetermined temperature and intimately mixing with the air stream within the spray tower so that the air stream is completely saturated with water and the temperature of the air stream exiting the spray tower equals the temperature of the water stream entering the saturator;

the packing elements enhancing heat transfer between the water and the air stream and saturation of the air stream, and the water also scrubbing the air stream and removing particulate contaminants within the air stream;

heat transfer means for heating the air stream or chilling the water prior to the entry of the heated air stream or the chilled water into the spray tower; and

a first temperature sensor positioned to measure the temperature of the air stream exiting the spray tower, the heat transfer means being adjustably responsive to the temperature measurement of the first temperature sensor.

(Col. 12, line 50 – Col. 13, line 22)

Applicants respectfully submit, however, that claim 1, as amended is not obvious under 35 U.S.C. §103 in view of EP '050 and JP '617. Claim 1 includes the following limitations.

A system for controlling the temperature and humidity of gas, comprising:
a contactor, including contact media, a gas inlet and a gas outlet, a liquid inlet and a liquid outlet, wherein the liquid inlet admits a liquid above the contact media and the gas inlet admits gas below the contact media, and the liquid and gas flow external to the contact media such that the gas leaves through the gas outlet in saturated state;
a heater;
a chiller for chilling the liquid, the chiller including a refrigeration system and a heat exchanger, the heat exchanger including a matrix of thermal electric chips disposed between two plates;
a gas outlet line connecting the gas outlet to the heater;
a liquid outlet line connecting the liquid outlet to the chiller, wherein the liquid flows through the liquid inlet, the contactor, the liquid outlet and the chiller;
a saturated temperature sensor associated with the gas outlet line and upstream of the heater;
a dry bulb temperature sensor associated with the gas outlet line and downstream of the heater;
a gas temperature set point;
a relative humidity set point; and
a controller, including a computer, coupled to the saturated temperature sensor, the dry bulb temperature sensor, the gas temperature set point, the relative humidity set point, and the computer, wherein the saturated temperature sensor, the relative humidity set point, and the gas temperature set point are inputs to the computer to produce a command signal adjusting the cooling rate of the chiller, wherein the dry bulb temperature sensor and the gas temperature set point are inputs to the computer to produce a command signal adjusting the heating rate of the heater, wherein the controller adjusts the heater and the chiller to deliver the gas from the heater at a desired temperature and relative humidity.

(Claim 1) (emphasis added)

In contrast, neither EP '050 nor JP '617 disclose the limitation of a chiller having a refrigeration system and a heat exchanger including a matrix of thermal electric chips. EP '050 does not show or describe the chiller referred to by the Examiner and referenced at col. 9, lines 1 –7. EP '050 does not disclose the use of thermal electric chips in the heat exchanger.

Given that claims 2 – 6 and 27 depend, directly or indirectly, from claim 1, applicants submit that claims 2 – 6 and 27 are, likewise, not obvious under §103 in view of the references cited by the Examiner. Further, given that claim 7 includes the limitation of a heat exchanger

having a matrix of thermal electric chips, and given that claims 8 -12 and 28 depend, directly or indirectly, from claim 7, applicants submit that claims 8 -12 and 28 are, likewise, not obvious under §103 in view of the references cited by the Examiner.

It is also respectfully submitted that EP '050 does not teach or suggest a combination with JP '617 and that JP '617 does not teach or suggest a combination with EP '050.

Claims 1, 2, 6-8, 12, and 24-26 stand rejected under 35 U.S.C. §103 as being unpatentable over the prior art as applied to claims 1, 2, 6-8, 12, and 24-26 above, and further in view of U.S. Patent No. 4,044,078 of Curtis, et al. ("Curtis"). The Examiner states

Curtis shows a chiller heat exchanger 26 which would have been obvious to use in EP '050 in the pump line connected between pump 18 and spray nozzles 27 to perform the cooling function described in col. 9, lines 5-9 or EP '050. Such a position would advantageously aid in servicing the unit.

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For the reasons discussed above, applicants respectfully submit, that claims 1 – 12, 27 and 28 are not obvious under 35 U.S.C. §103 in view of the prior art as applied to claims 1, 2, 6-8, 12, and 24-26 above and further in view of Curtis.

Claims 3 and 9 stand rejected under 35 U.S.C. §103 as being unpatentable over any of the prior art as applied to claims 1 and 7 above, and further in view of U.S. Patent No. 3,533,607 of Powers ("Powers"). The Examiner states

Powers shows a liquid distributor (see Figure 2) in which the reactive force of the liquid rotates the distributor. To have added/substituted such a distributor to the prior art to improve liquid distribution to the solid media and thereby improve the degree of saturation would have been obvious.

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For the reasons discussed above, applicants respectfully submit, that claims 3 and 9 are not obvious under 35 U.S.C. §103 in view of the prior art as applied to claims 1 and 7 above and further in view of Powers.

Claims 4 and 10 stand rejected under 35 U.S.C. §103 as being unpatentable over any of the prior art as applied to claims 1 and 7 above, and further in view of U.S. Patent No. 5,086,829 of Asakawa ("Asakawa") or U.S. Patent No. 4,951,738 of Litzberg ("Litzberg").

For the reasons discussed above, applicants respectfully submit, that claims 4 and 10 are not obvious under 35 U.S.C. §103 in view of the prior art as applied to claims 1 and 7 above and further in view of Litzberg.

Claims 5 and 11 stand rejected under 35 U.S.C. §103 as being unpatentable over any of the prior art as applied to claims 1 and 7 above, and further in view of U.S. Patent No. 2,828,761 of Weibert, Jr. ("Weibert"). The Examiner states

Weibert discloses a system, which prevents scale build-up in a direct contact cooling system (such as disclosed in prior art) by periodically draining the lime-concentrated liquid and refilling the sump with fresh water.

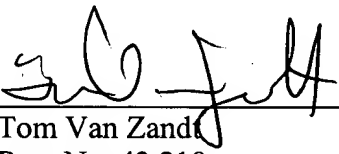
(p. 6, Office Action 4/13/04)

Applicants respectfully submit, however, that claims 5 and 11 are not obvious under 35 U.S.C. §103 in view of the prior art as applied to claims 1 and 7 above and further in view of Weibert, both for the reasons discussed above, and because Weibert fails to disclose the limitations of a controller that sends a signal to a liquid supply means to admit fresh liquid from the supply means at periodic times. Anything in Weibert that could possibly be equated with a "controller", nevertheless, does not employ a signal sent to the liquid supply means. Moreover, the system in Weibert does not consider the ability of a chiller to maintain the liquid at a desired temperature.

It is respectfully submitted that in view of the amendments and arguments set forth herein, the applicable rejections and objections have been overcome. If there are any additional charges, please charge Deposit Account No. 02-2666 for any fee deficiency that may be due.

Respectfully submitted,

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